

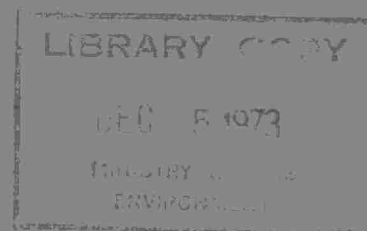
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OPERATING SUMMARY

FORT FRANCES

TD227  
F67  
W38  
1972  
MOE

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Ontario

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Ministry of the  
Environment

135 St. Clair Avenue West  
Toronto 195, Ontario

We are pleased to present you with the 1972 operating summary for the water pollution control plant serving your community.

This summary contains data on the performance of the plant as well as relevant financial information. Of particular interest is the review of the year's activities in which significant items of these data are discussed in some detail by the operations engineer and his staff who, by their day-to-day involvement with the operation, are thoroughly familiar with the plant.

We appreciate your continuing interest in protecting the environment through the efficient operation of this wastewater treatment facility.

D.S. Caverly,  
Assistant Deputy Minister.

D.A. McTavish, P. Eng.,  
Director,  
Project Operations Branch.



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E. Czarnecki

135 St. Clair Avenue West  
Toronto 195

**FORT FRANCES  
WATER POLLUTION CONTROL PLANT**

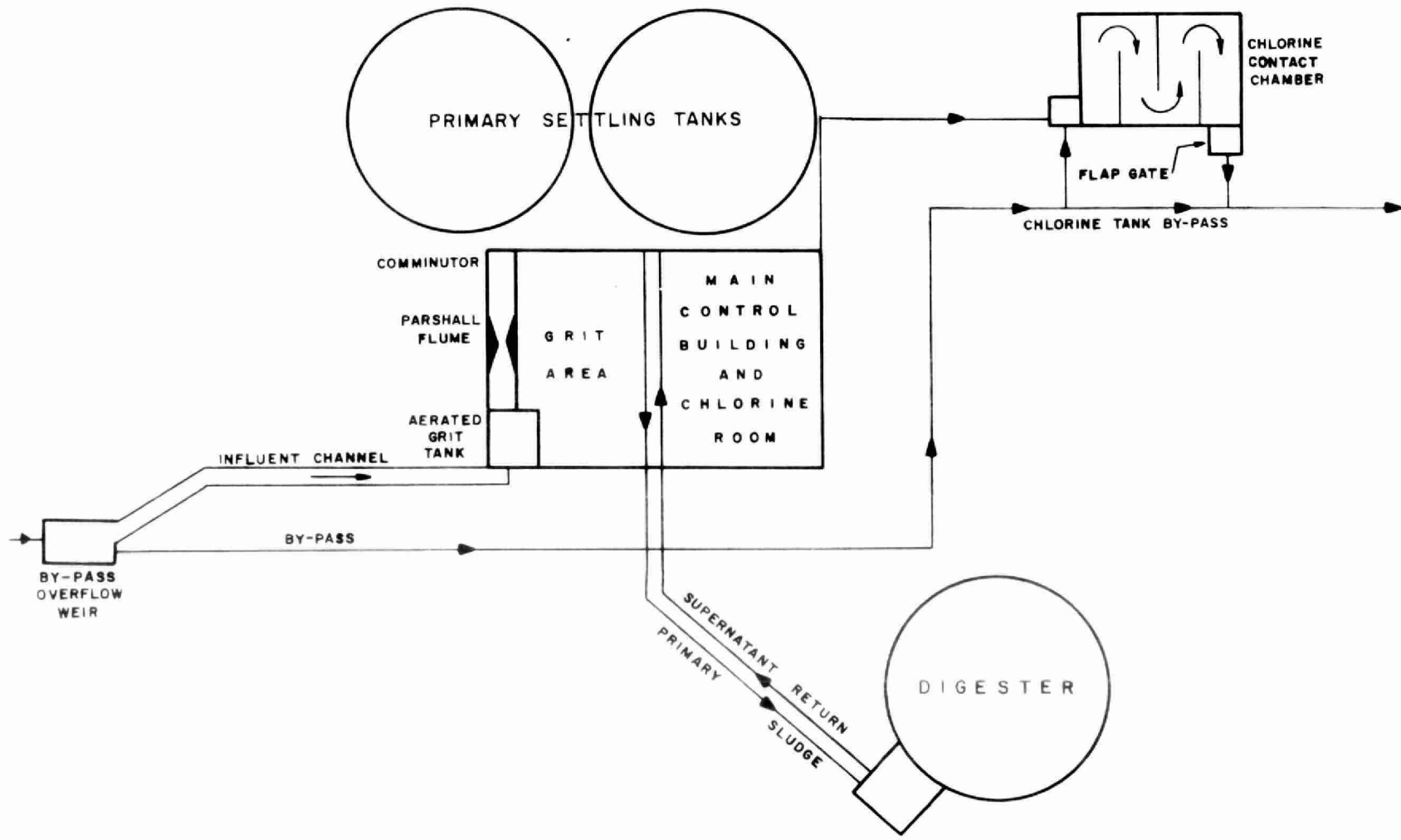
operated for  
THE TOWN OF FORT FRANCES  
by the  
MINISTRY OF THE ENVIRONMENT

**1972 ANNUAL OPERATING SUMMARY**

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FORT FRANCES W P C P  
FLOW CHART



## DESIGN DATA

|                   |           |                                                                                                               |                                                                                                                                |
|-------------------|-----------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| PROJECT NO.       | 2-0060-59 | <u>PRIMARY TREATMENT</u>                                                                                      | Loading: Surface, 625 gal/ft <sup>2</sup> /day<br>Weir, 9,660 gal/ft/day                                                       |
| TREATMENT         | Primary   | <u>Screening</u>                                                                                              | <u>CHLORINATION</u>                                                                                                            |
| DESIGN FLOW       | 2.0 mgd   | - Coarse bar screen (2")                                                                                      | Type: W & T Model A-731<br>Size: 400 lb/day                                                                                    |
| DESIGN POPULATION | 12,000    | <u>Comminution</u>                                                                                            |                                                                                                                                |
| BOD - Raw Sewage  | 130 mg/l  | Type: Smith & Loveless Model 15R                                                                              | <u>Chlorine Contact Chamber</u>                                                                                                |
| - Removal         | 40%       | <u>Grit Removal</u>                                                                                           | Size: 27' x 20' x 8.5' (avg)<br>(4,590 cu ft or 28,600 gal)<br>Retention: 20.6 min                                             |
| SS - Raw Sewage   | 180 mg/l  | Type: Aerated; grit removed by clamshell bucket                                                               | <u>OUTFALL</u>                                                                                                                 |
| - Removal         | 60%       | Size: One 10' 5" x 10' 5" x 13' 9" swd<br>(1515 cu ft or 9,400 gal)<br>Retention: 6.8 min                     | - to Rainy River                                                                                                               |
|                   |           | <u>Air Supply</u>                                                                                             | <u>SLUDGE HANDLING</u>                                                                                                         |
|                   |           | Type: Roots-Connersville<br>Size: One 100 scfm @ 9 psi                                                        | <u>Digestion System</u>                                                                                                        |
|                   |           | <u>Primary Sedimentation</u>                                                                                  | Type: Single stage with floating cover;<br>gas mixed                                                                           |
|                   |           | Type: Eimco Process<br>Size: Two 40' x 40' x 10' swd<br>(32,000 cu ft or 200,000 gal)<br>Retention: 2.4 hours | Size: One 40' dia x 25' swd (31,500 cu ft<br>or 195,500 gal)<br>Loading: 1.38 lb/cu ft/mo<br>Mixer: Roots-Connersville Type XA |

# '72 Review

## GENERAL

The primary treatment plant and five pumping stations are operated by the chief operator and two operators.

## EXPENDITURES

A total of \$50,094.91 was spent which represents \$76.24 per million gallons treated or 34 cents per pound of BOD removed.

## PLANT FLOWS AND CHLORINATION

A total of 657.1 million gallons was received in 1972. The average daily flow was 1.8 million gallons. The daily flow exceeded the design flow approximately 17 percent of the time. It should be noted that on a yearly basis over the past seven years, the flows have remained somewhat constant. Chlorine was applied from January to December at an average dosage of 3.3 mg/l. A total of 21,730 pounds of chlorine was used during this period.

## PLANT EFFICIENCY

The raw sewage BOD concentration averaged 75 mg/l which was reduced 31 percent to an effluent BOD concentration of 52 mg/l. The average raw suspended solids concentration was 117 mg/l which was reduced to 61 mg/l, a reduction of 48 percent. A total of 319 cubic feet of grit was removed in 1972.

## SLUDGE DIGESTION AND DISPOSAL

A total of 146,000 gallons of digested sludge was removed in 1972 and 876 cubic yards of sludge hauled. The average total solids concentration was 7.3 percent. The volatile solids was reduced from 59 to 43 percent.



### CONCLUSIONS AND RECOMMENDATIONS

Flows decreased in 1972, however sewage strength remained essentially the same. Plant efficiencies were essentially the same.

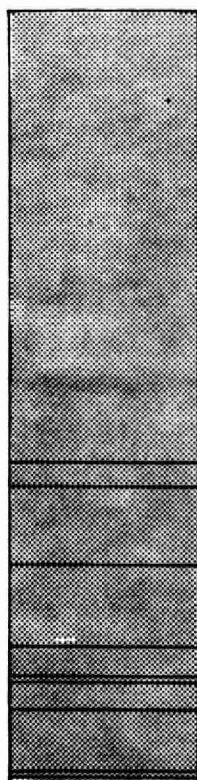
It is recommended that the municipality continue its sewer separation program. If successful it is felt that some development could be allowed without cause for expansion. However, consideration should be given to providing stand-by power at the Central Avenue pumping station.

## PROJECT COSTS

|                                                                       |                          |
|-----------------------------------------------------------------------|--------------------------|
| NET CAPITAL COST                                                      | \$1, 894, 347. 61        |
| DEDUCT - Portion financed by<br>CMHC (Final)                          | <u>(1, 276, 239. 07)</u> |
| Long Term Debt to MOE                                                 | \$ <u>618, 108. 54</u>   |
| Debt Retirement Balance at Credit<br>(Sinking Fund) December 31, 1972 | \$ <u>132, 028. 52</u>   |
| Net Operating                                                         | \$ 50, 514. 68           |
| Debt Retirement                                                       | 6, 383. 00               |
| Reserve                                                               | 7, 526. 63               |
| Interest Charged                                                      | <u>34, 662. 88</u>       |
| TOTAL                                                                 | \$ <u>99, 087. 19</u>    |

### RESERVE ACCOUNT

|                             |                        |
|-----------------------------|------------------------|
| Balance @ January 1, 1972   | \$ 98, 147. 85         |
| Deposited by Municipality   | 7, 526. 63             |
| Interest Earned             | <u>6, 483. 14</u>      |
|                             | \$ 112, 157. 62        |
| Less Expenditures           | <u>-</u>               |
| Balance @ December 31, 1972 | \$ <u>112, 157. 62</u> |



## OPERATING COSTS

|                         |      |
|-------------------------|------|
| ● PAYROLL               | 58 % |
| ● FUEL                  | 4 %  |
| ● POWER                 | 10 % |
| ● CHEMICALS             | 10 % |
| ● GENERAL SUPPLIES      | 4 %  |
| ● EQUIPMENT             | 1 %  |
| ● REPAIRS & MAINTENANCE | 4 %  |
| ● SUNDRY                | 8 %  |
| ● WATER                 | 1 %  |
| ● TRAVEL                | <1 % |

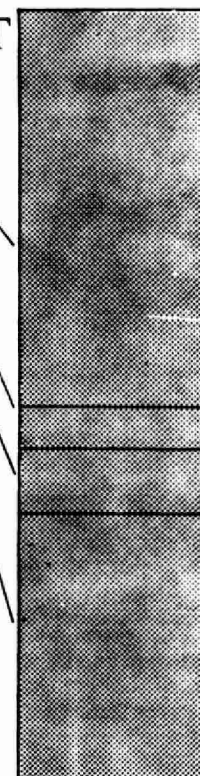
# 1972 COSTS

## TOTAL ANNUAL COST

|                 |      |
|-----------------|------|
| NET OPERATING   | 51 % |
| DEBT RETIREMENT | 6 %  |
| RESERVE         | 8 %  |
| INTEREST        | 35 % |

## YEARLY OPERATING COSTS

| YEAR | SEWAGE TREATED<br>in million gallons | TOTAL<br>OPERATING COSTS | TREATMENT COSTS    |              |
|------|--------------------------------------|--------------------------|--------------------|--------------|
|      |                                      |                          | \$ per million gal | ¢ per lb BOD |
| 1968 | 736.200                              | 36,705.23                | 39.86              | 11 cents     |
| 1969 | 692.810                              | 38,741.52                | 55.92              | 13 cents     |
| 1970 | 686.4                                | 44,640.95                | 65.04              | 14 cents     |
| 1971 | 714.6                                | 51,518.62                | 72.10              | 21 cents     |
| 1972 | 657.1                                | 50,094.91                | 76.20              | 34 cents     |

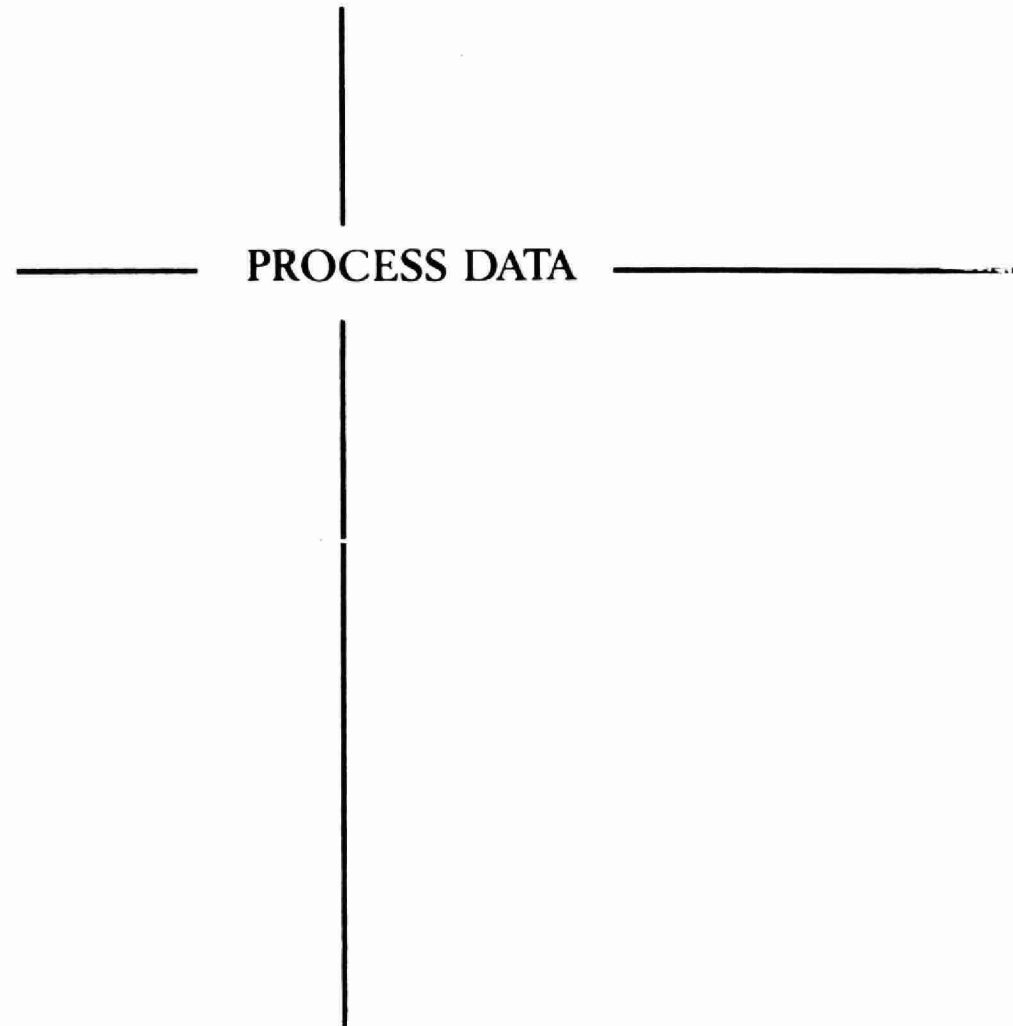


## MONTHLY OPERATING COSTS

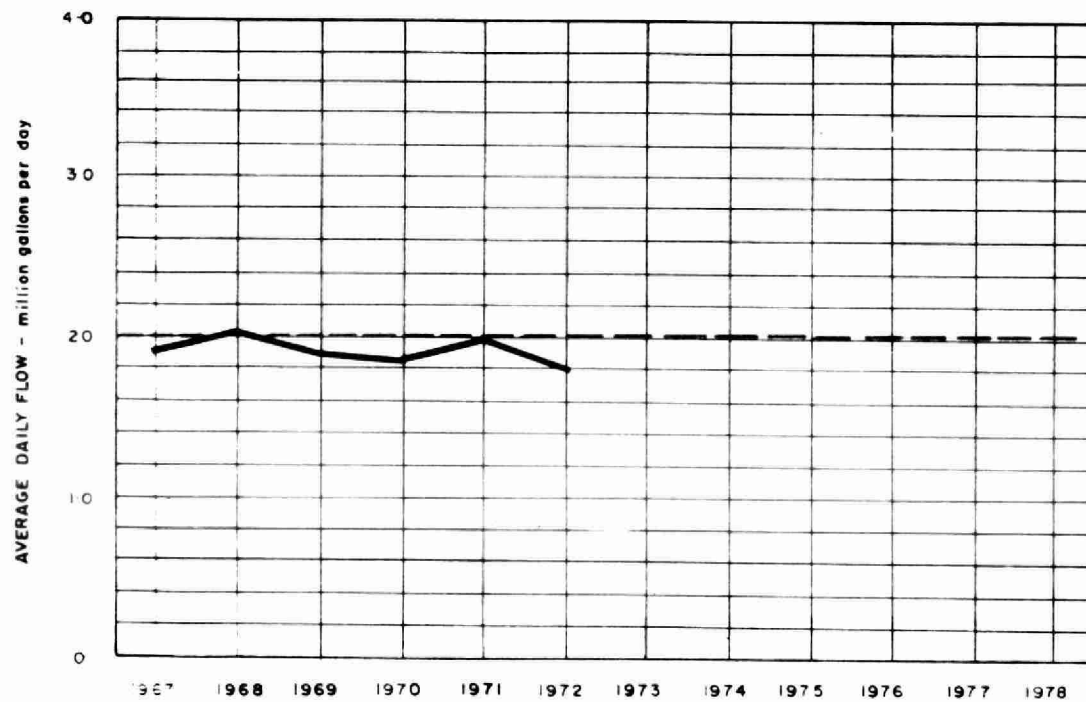
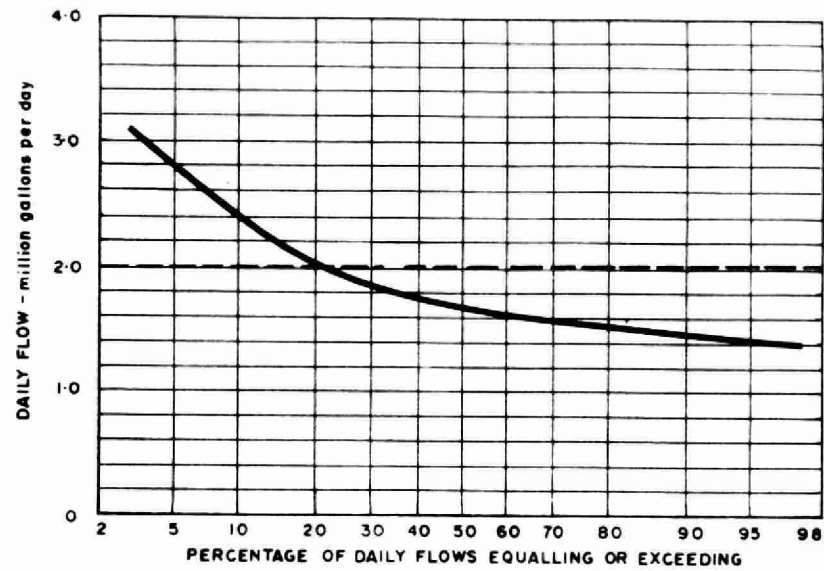
| MONTH | TOTAL<br>EXPENDITURE | REGULAR<br>PAYROLL | CASUAL<br>PAYROLL | FUEL    | POWER   | CHEMICALS | GENERAL<br>SUPPLIES | EQUIPMENT | REPAIRS and<br>MAINTENANCE | SUNDRY* | WATER  | TRAVEL |
|-------|----------------------|--------------------|-------------------|---------|---------|-----------|---------------------|-----------|----------------------------|---------|--------|--------|
| JAN   | 2482.02              | 2063.28            |                   |         | 331.94  |           | 14.18               |           | 23.67                      | 48.95   |        |        |
| FEB   | 3618.16              | 2178.85            |                   | 283.50  | 437.39  | 437.63    | 190.76              |           | 41.74                      | 12.29   | 36.00  |        |
| MAR   | 4330.18              | 2139.91            |                   | 863.74  | 442.75  |           |                     |           | 104.87                     | 742.91  | 36.00  |        |
| APR   | 3955.29              | 2282.70            |                   |         | 417.48  | 437.63    | 418.92              |           | 295.41                     | 67.15   | 36.00  |        |
| MAY   | 4330.43              | 2307.85            |                   | 437.35  | 457.81  | 437.63    | 191.52              |           | 398.36                     | 62.83   | 37.08  |        |
| JUNE  | 4237.53              | 3240.56            |                   |         | 372.27  |           | 270.97              |           | 293.44                     | 19.49   | 40.80  |        |
| JULY  | 1495.08              | 57.31              |                   |         | 398.03  | 447.75    | 173.06              | 28.61     | 125.66                     | 223.86  | 40.80  |        |
| AUG   | 3063.03              | 2104.61            |                   | 42.00   | 389.29  | 447.75    | 40.64               |           |                            | (2.06)  | 40.80  |        |
| SEPT  | 4617.20              | 2237.50            |                   |         | 374.71  | 384.75    | 205.94              | 134.30    | 169.23                     | 1069.97 | 40.80  |        |
| OCT   | 3639.12              | 2497.89            |                   |         | 397.55  | 416.25    | 253.22              |           | 17.07                      | 16.34   | 40.80  |        |
| NOV   | 2115.55              | 24.84              |                   |         | 372.76  |           | 80.02               |           | 109.87                     | 1452.28 | 40.80  | 34.98  |
| DEC   | 12211.32             | 7797.87            |                   | 467.21  | 738.24  | 2081.25   | 446.60              | 176.08    | 243.45                     | 179.02  | 81.60  |        |
| TOTAL | 50094.91             | 28933.17           |                   | 2093.80 | 5130.22 | 5090.64   | 2285.83             | 338.99    | 1822.77                    | 3893.03 | 471.48 | 34.98  |

Brackets indicate credit.

\* Sundry includes sludge haulage costs of \$2,351.50



# FLOWS

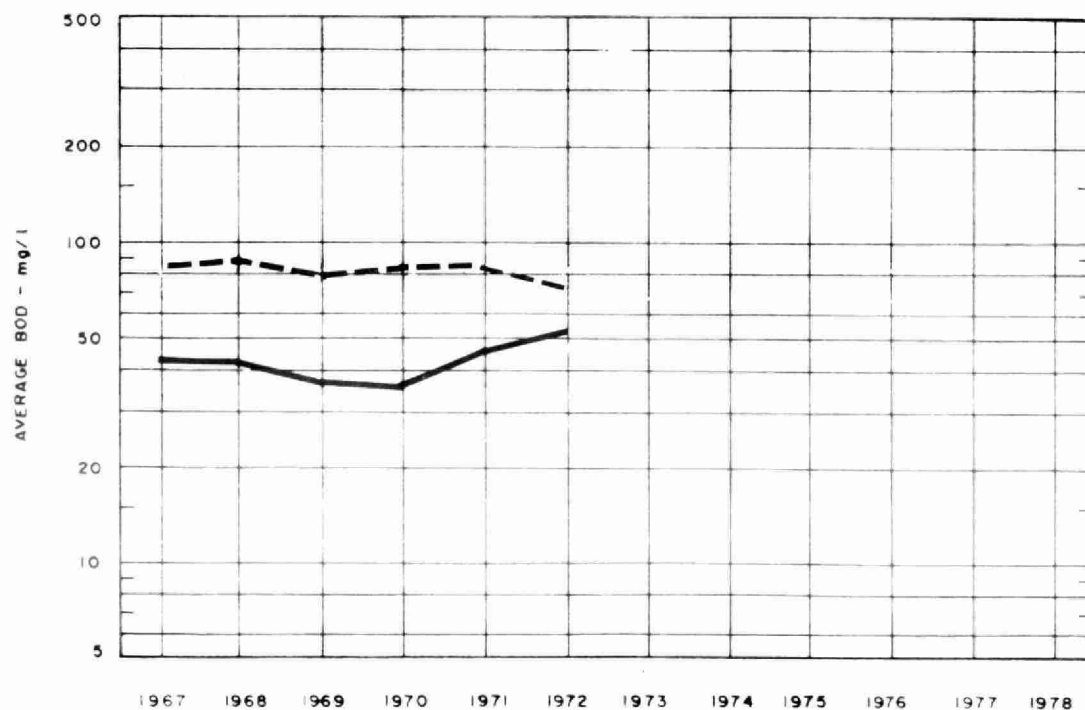
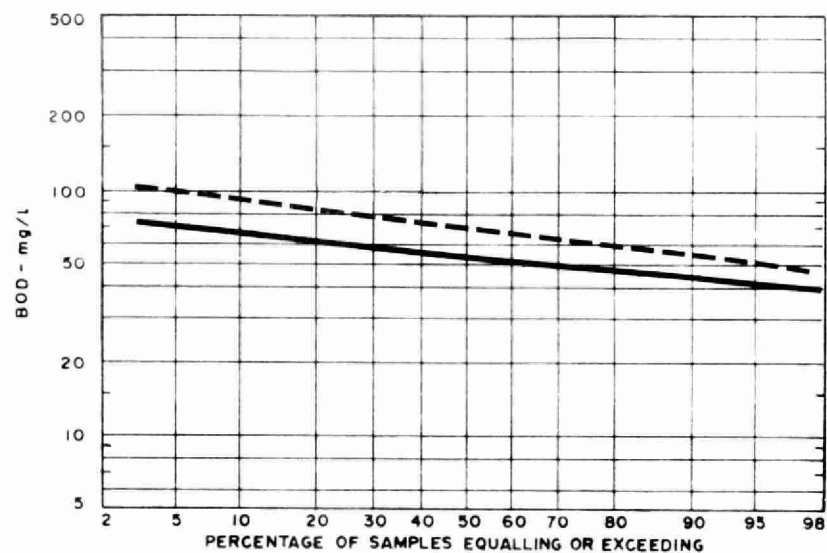


DESIGN CAPACITY — — — — —

## PLANT PERFORMANCE

| MONTH          | FLOWS           |             |                | BIOCHEMICAL OXYGEN DEMAND |          |           |                        | SUSPENDED SOLIDS |          |           |                        | PHOSPHORUS |          |
|----------------|-----------------|-------------|----------------|---------------------------|----------|-----------|------------------------|------------------|----------|-----------|------------------------|------------|----------|
|                | TOTAL FLOW      | AVERAGE DAY | MAXIMUM DAY    | INFLUENT                  | EFFLUENT | REDUCTION |                        | INFLUENT         | EFFLUENT | REDUCTION |                        | INFLUENT   | EFFLUENT |
|                | million gallons | mil. gal    | mgd            | mg/l                      | mg/l     | %         | 10 <sup>3</sup> pounds | mg/l             | mg/l     | %         | 10 <sup>3</sup> pounds | mg/l P     | mg/l P   |
| JAN            | 49.7            | 1.60        | 1.7            | 73                        | 47       | 36        | 12.9                   | 90               | 49       | 46        | 20.4                   | 4.7        | 3.6      |
| FEB            | 44.7            | 1.54        | 1.7            | 93                        | 71       | 24        | 9.8                    | 106              | 46       | 57        | 26.8                   |            |          |
| MAR            | 54.1            | 1.74        | 2.4            | 91                        | 50       | 45        | 22.2                   | 105              | 49       | 53        | 30.3                   | 4.6        | 4.0      |
| APR            | 76.2            | 2.54        | 3.3            | 85                        | 51       | 40        | 25.9                   | 120              | 60       | 50        | 45.7                   | 3.6        | 2.7      |
| MAY            | 64.2            | 2.07        | 3.4            | 69                        | 51       | 26        | 11.6                   | 95               | 63       | 34        | 20.5                   | 4.7        | 4.5      |
| JUNE           | 54.7            | 1.82        | 2.1            | 55                        | 44       | 22        | 6.0                    | 81               | 64       | 21        | 9.3                    | 3.3        | 3.2      |
| JULY           | 58.2            | 1.87        | 3.0            | 67                        | 58       | 13        | 5.2                    | 104              | 57       | 45        | 27.3                   | 5.8        | 4.4      |
| AUG            | 55.6            | 1.79        | 2.0            | 67                        | 52       | 22        | 8.3                    | 109              | 63       | 42        | 25.6                   | 3.1        | 3.3      |
| SEPT           | 45.2            | 1.51        | 1.9            | 76                        | 51       | 33        | 11.3                   | 171              | 77       | 55        | 42.5                   |            |          |
| OCT            | 49.6            | 1.60        | 1.9            | 77                        | 53       | 31        | 11.9                   | 180              | 89       | 51        | 45.1                   | 5.0        | 4.2      |
| NOV            | 53.3            | 1.77        | 2.3            | 76                        | 50       | 34        | 13.8                   | 126              | 56       | 56        | 37.3                   | 6.4        | 4.0      |
| DEC            | 51.6            | 1.66        | 2.2            | 68                        | 50       | 26        | 9.1                    | 105              | 57       | 46        | 24.3                   | 4.8        | 4.9      |
| TOTAL          | 657.1           | -           | -              | -                         | -        | -         | 148.0                  | -                | -        | -         | 355.1                  | -          | -        |
| AVG.           |                 | 1.8         | MAXIMUM<br>3.4 | 75                        | 52       | 31        | 12.3                   | 117              | 61       | 48        | 29.6                   | 4.6        | 3.9      |
| No. of Samples | -               | -           | -              | 57                        | 57       | -         | -                      | 59               | 59       | -         | -                      | 11         | 11       |

# BIOCHEMICAL OXYGEN DEMAND

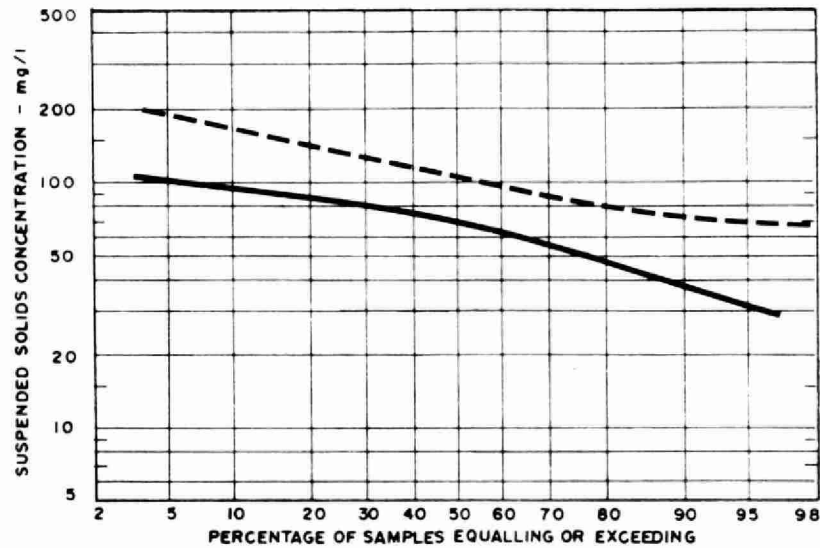


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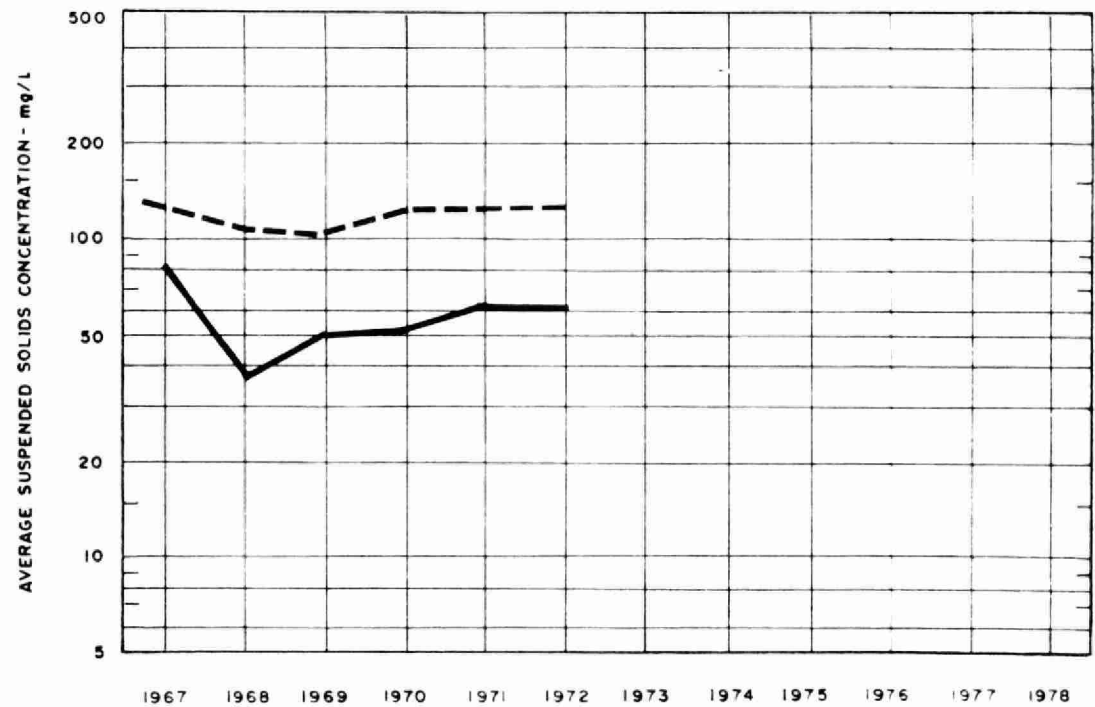


# SUSPENDED SOLIDS

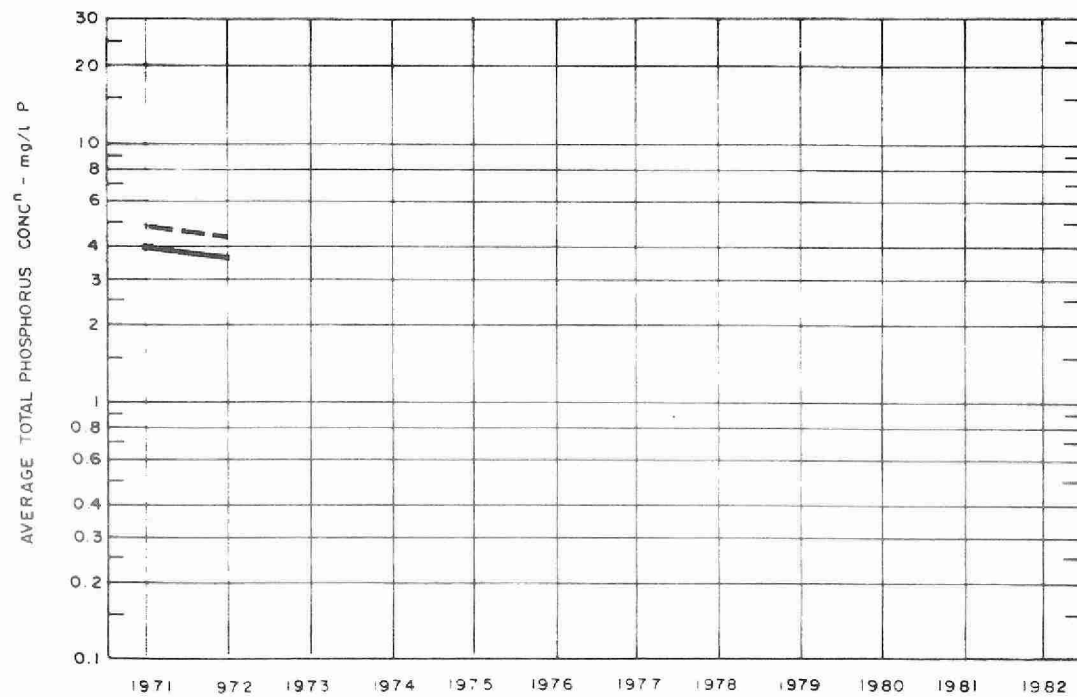
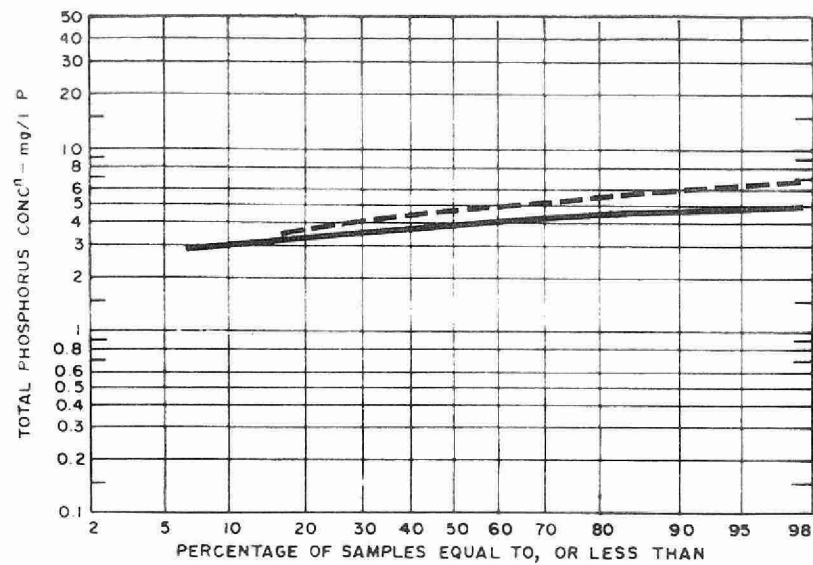


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PLANT EFFLUENT      \_\_\_\_\_



# PHOSPHORUS

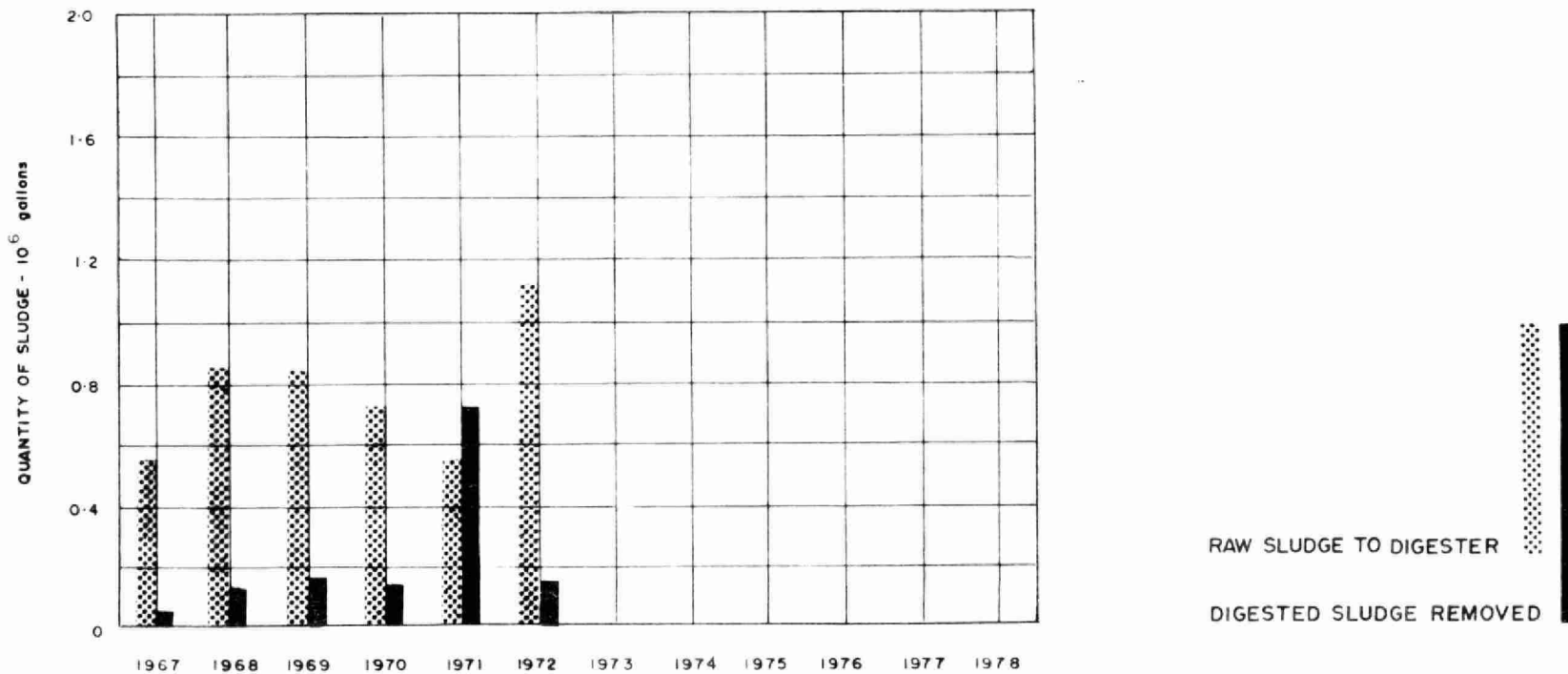
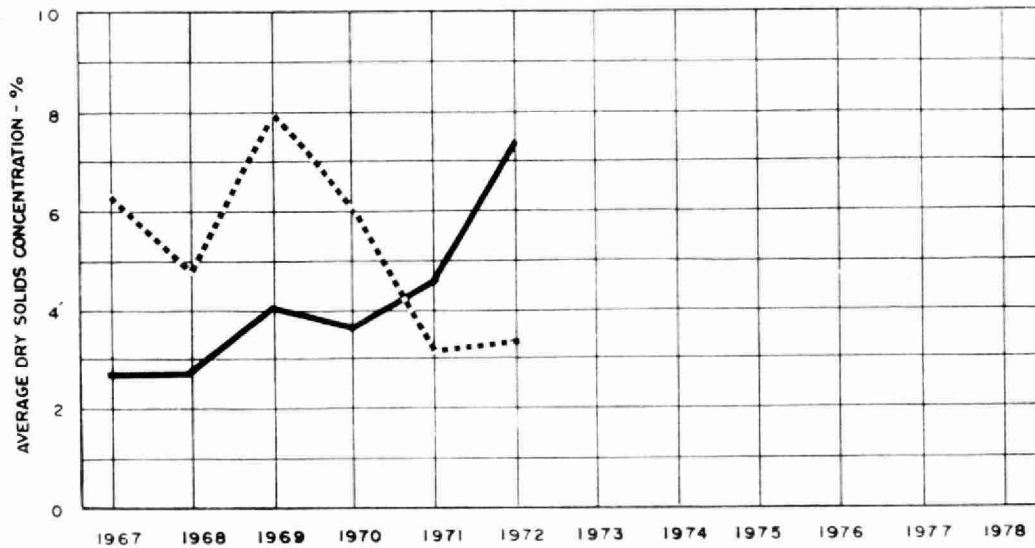


PLANT INFLUENT

PLANT EFFLUENT

# DIGESTION

RAW SLUDGE .....  
DIGESTED SLUDGE ———



## TREATMENT DATA

| MONTH | GRIT<br>QUANTITY<br>REMOVED<br>cubic feet | CHLORINATION                               |                           | SLUDGE DIGESTION and DISPOSAL          |                      |                         |                                                   |                      |                         |                      |                                 |
|-------|-------------------------------------------|--------------------------------------------|---------------------------|----------------------------------------|----------------------|-------------------------|---------------------------------------------------|----------------------|-------------------------|----------------------|---------------------------------|
|       |                                           | CHLORINE USED<br>10 <sup>3</sup><br>pounds | AVERAGE<br>DOSAGE<br>mg/l | RAW SLUDGE                             |                      |                         | DIGESTED SLUDGE                                   |                      |                         | SUPERNATANT          | SLUDGE<br>HAULED<br>cubic yards |
|       |                                           |                                            |                           | QUANTITY<br>10 <sup>3</sup><br>gallons | TOTAL<br>SOLIDS<br>% | VOLATILE<br>SOLIDS<br>% | QUANTITY<br>REMOVED<br>10 <sup>3</sup><br>gallons | TOTAL<br>SOLIDS<br>% | VOLATILE<br>SOLIDS<br>% | TOTAL<br>SOLIDS<br>% |                                 |
| JAN   | 11                                        | 2.00                                       | 4.1                       | 62.0                                   | 2.5                  | 70                      | 12.0                                              | 8.5                  | 34                      | .1                   | 72                              |
| FEB   | 3                                         | 1.62                                       | 3.6                       | 56.4                                   | 2.0                  | 71                      | 13.0                                              | 6.2                  | 51                      | .3                   | 78                              |
| MAR   | 11                                        | 1.84                                       | 3.4                       | 70.2                                   | 2.4                  | 68                      | 14.0                                              | 5.6                  | 51                      | .1                   | 84                              |
| APR   | 83                                        | 1.60                                       | 2.1                       | 90.3                                   | 3.7                  | 44                      | 11.0                                              | 8.2                  | 43                      | .1                   | 66                              |
| MAY   | 13                                        | 1.92                                       | 3.0                       | 96.2                                   | 3.0                  | 54                      | 9.0                                               | 8.0                  | 43                      | .1                   | 54                              |
| JUNE  | 44                                        | 1.94                                       | 3.5                       | 103.7                                  | 4.0                  | 56                      | 13.0                                              | 9.0                  | 41                      | .1                   | 78                              |
| JULY  | 22                                        | 2.06                                       | 3.5                       | 107.2                                  | 3.4                  | 56                      | 16.0                                              | 8.2                  | 43                      | .5                   | 96                              |
| AUG   | 29                                        | 2.24                                       | 4.0                       | 107.1                                  | 5.3                  | 52                      | 20.0                                              | 8.7                  | 40                      | .1                   | 120                             |
| SEPT  | 40                                        | 2.37                                       | 5.2                       | 103.7                                  | 2.4                  | 63                      | 10.0                                              | 8.2                  | 36                      | .1                   | 60                              |
| OCT   | 23                                        | 2.25                                       | 4.5                       | 100.5                                  | 4.6                  | 50                      | 5.0                                               | 6.6                  | 42                      | .3                   | 30                              |
| NOV   | 27                                        | 1.64                                       | 3.1                       | 115.9                                  | 3.5                  | 57                      | 18.0                                              | 7.2                  | 45                      | .1                   | 108                             |
| DEC   | 13                                        | 2.00                                       | 3.9                       | 107.1                                  | 2.7                  | 64                      | 5.0                                               | 3.6                  | 52                      | .1                   | 30                              |
| TOTAL | 319                                       | 23.48                                      | —                         | 1121.5                                 | —                    | —                       | 146.0                                             | —                    | —                       | —                    | 876                             |
| AVG   | 0.5<br>cubic feet/mil gal                 | 1.96                                       | 3.6                       | 93.5                                   | 3.3                  | 59                      | 12.2                                              | 7.3                  | 43                      | .2                   | 73                              |

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